

# FY 2024 Yellowstone River and Tributaries “Corners and Borders for Pollinators” Targeted Implementation Plan (TIP)

Billings NRCS Field Office, Yellowstone County

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*Figure 1.1 – (Photo courtesy Noah Starling – Pheasants Forever).*

## TIP Summary:

***Promoting pollinator friendly plantings in riparian, rangeland, and cropland to attract beneficial insects for agricultural uses. The project would improve pollinator habitat, upland bird nesting cover, climate-smart irrigation methods, integrated pest management systems (IPM) to protect pollinators, and potential pollination of agricultural crops. Implementation would occur during Fiscal Years 2024-2028 at the estimated cost of \$3,400,000. If the TIP is successful, there would be opportunity to expand the TIP to surrounding counties along the Yellowstone River and tributaries corridors.***

### Priority Resource Concern:

- **Terrestrial Habitat – Terrestrial habitat for Wildlife and Invertebrates.**

### Secondary Resource Concerns:

- **Degraded Plant Condition – Plant Structure and Composition.**
- **Soil Quality Limitations – Organic Matter Depletion.**

## Problem Statement:

It is no secret that pollinator populations have decreased, in part due to pesticides, diseases, loss of habitat, and parasites <sup>(1,2,3,4,5,6)</sup>. Honeybees have been on a decline for a long period (*Fig 1.2*) while also generally an estimated 29% of bee species are declining (*Fig 1.3*). The Yellowstone River and Tributaries Pollinator TIP supports habitat for pollinating species such as moths, butterflies, and bees. In addition, Montana is one of the top five honey producing states in the United States. Honey production throughout the state of Montana has decreased in recent years as well, which is concerning. Montana honey production in 2020 from producers with five or more colonies totaled 8.91 million pounds, down 40 percent from 2019, according to the National Agricultural Statistics Service, USDA. There were 110,000 colonies producing honey in 2020, down 36 percent from 2019.

This TIP aligns with the USDA FY 2022-2026 Strategic Plan (Page 9) on ensuring pollinator resiliency. Additionally, the Yellowstone County long range plan (Page 21 and 27) states that specifically on irrigated crop that " Declining pollinator health and reduced habitat attributed to pesticide use and weed control measures is an increasing public concern. Cash crops grown in the valley rely on pollination. There are some leaf cutter bee businesses as well as apiaries for honey production. Alternatives for seeding unusable production areas for pollinator friendly forb mixes are often presented but not always chosen." Pollinator habitat education and outreach has been identified as an education idea as well in the Long-Range Plan.

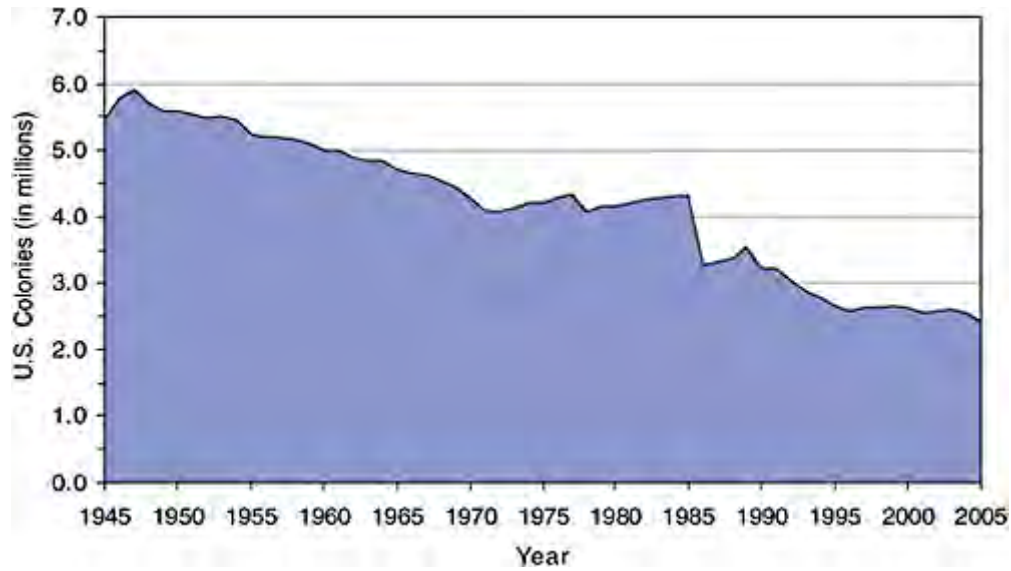
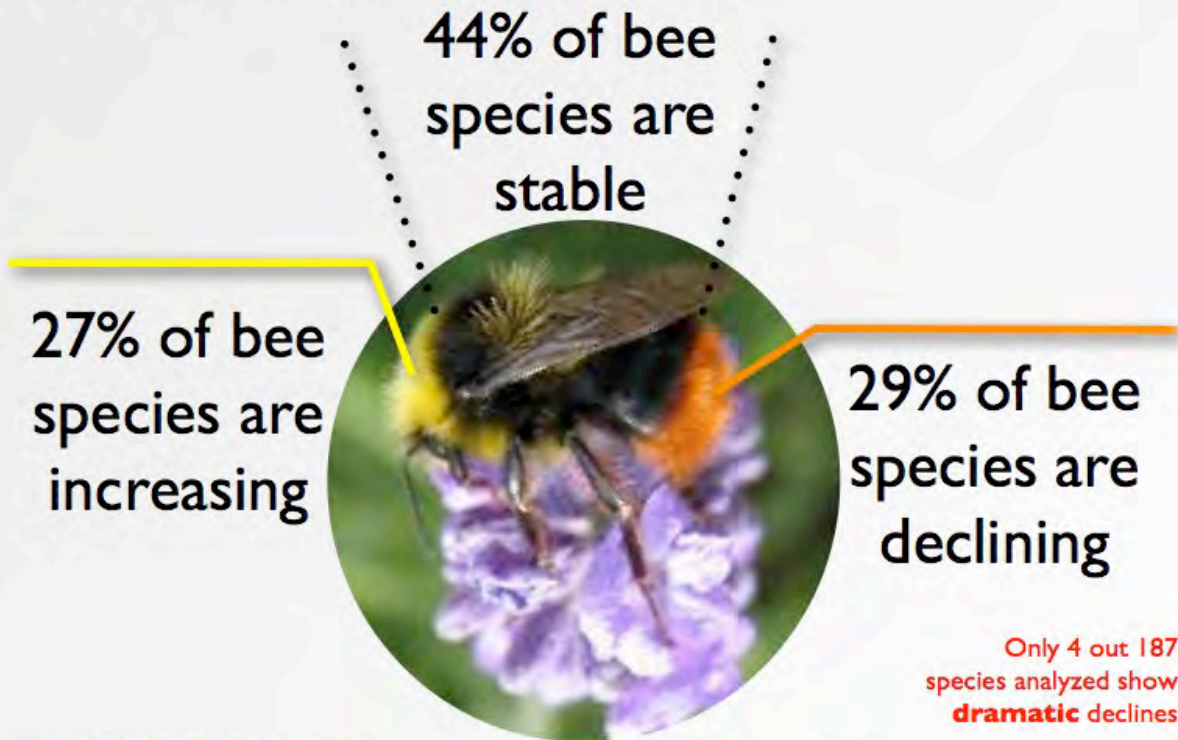


Fig 1.2: U.S. honeybee colonies, 1945–2005. Data compiled from USDA-NASS (1995, 1999, 2004a, 2005, 2006a). (Committee of the Status of Pollinators in North America. “2 Status of Pollinators.” Status of Pollinators in North America, National Academies Press, Washington, D.C., 2007.)

### Putting numbers to the pollination crisis



Bartomeus et al 2013 PNAS, In press.

Data reflects relative abundance changes in the northeastern US along the last 100 years

Fig 1.3 – Pollinator Status in the NE US – Bartomeus et al. 2013

In this project area, limited habitat is available for native pollinator species or honeybees in agricultural settings beyond the pollinated crops and some pasture and rangeland areas. One study stated that incentives should be offered to farmers to restore pollinator-friendly habitats, including flow provisioning within or around crop fields and elimination of use of insecticides by adopting agroecological production methods <sup>(12)</sup>. Pollinators and honeybees need undisturbed cover with flowers that bloom across different periods of the growing season to provide food and cover. In the project area agricultural activities associated with irrigated cropland do not provide for this habitat. Typically cash crops grown are monocultures and are harvested annually limiting available food and cover for pollinator species. Common practices in the project area include annual harvest, heavy pesticide use, farming all available land, and irrigating maximum acreages. In addition, excessive tillage on cropland can kill ground nesting bees <sup>(15)</sup>. These common agricultural practices do not provide the necessary habitat requirements for pollinator species, furthering their decline.

Pollinators are a natural part of terrestrial ecosystems. However, with pesticides and declining habitat, pollinator species are declining across much of the world. In the United States it is estimated that there has been a 50% decline in native bumble bee species <sup>(4)</sup>. This TIP would support pollinator habitat and resiliency across the 304,705 acres within Yellowstone County. Declining pollinators can cause an economic downturn in agriculture and getting ahead of the game to reduce decline is critical in creating a climate-resilient ag economy in Montana.

Recently the International Union for Conservation of Nature (IUCN) re-listed the monarch butterfly as endangered and currently it is a candidate for listing under the Endangered Species Act. Montana is one of the northern most areas of the monarch’s range with summer breeding populations in areas across the state. While not currently on the endangered species list, the continuing decline of pollinating species could lead to the listing of the monarch butterfly. Protecting pollinator habitat and creating more habitat will be a critical step towards this.

Yellowstone County has been known to experience significant erosive wind events. Conventional cropping rotations can leave bare ground throughout the county during the critical erosion season (November – April). Standing vegetation on the borders and corners of crop can reduce erosion. Additionally, this undisturbed habitat can be a location for ground nesting pollinator species such as the bumble bee.

This TIP will be broken down into two primary phases with a possible third phase expansion if adopted by neighboring work units. Phase 1 (Yellowstone County – East of Billings) is 159,662 acres and will occur during years 1 and 2, upon year 2 however we will apply to expand into phase 2 which would include West Yellowstone County and is approximately 110,384 acres. This will also connect the TIP areas to this TIP’s “sister” TIP in Bighorn County (also being presented for FY24 consideration, and a map showing these areas is listed in the appendix).

## Geographic Focus:

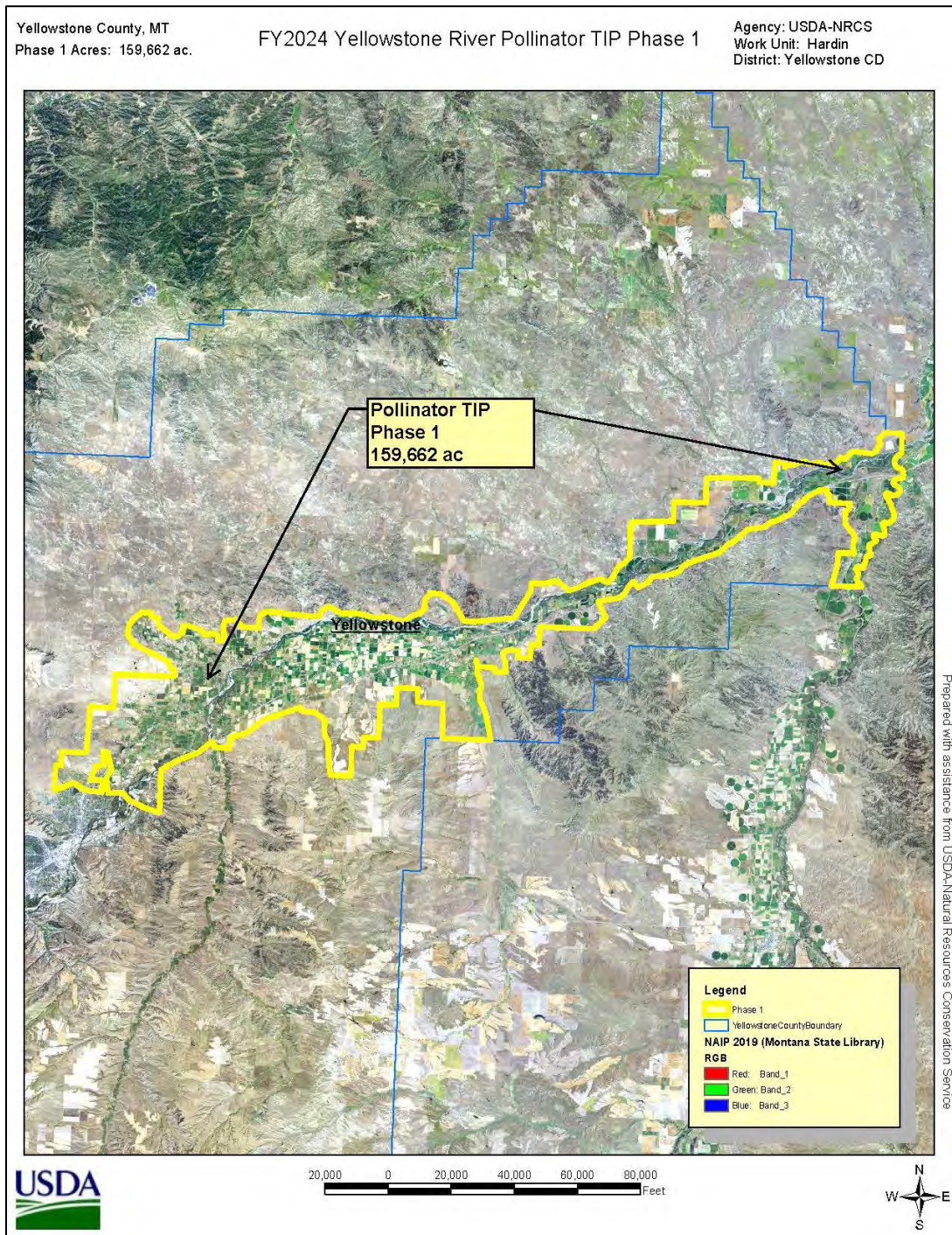


Figure 2.2- TIP project area map, Phase 1, which is 159,663 ac.

The 159,663-acre project area encompasses primarily the river corridors and some upland agricultural areas. The City of Billings was excluded from the project areas, but smaller towns and scattered non-agricultural areas are located within this project area boundary, which makes the actual acres eligible for this project considerably smaller. Apiaries are located

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throughout the entire Yellowstone valley (refer to the appendix for additional maps showing apiaries in both phase areas), which is largely why this TIP is targeted in the irrigated river valley.

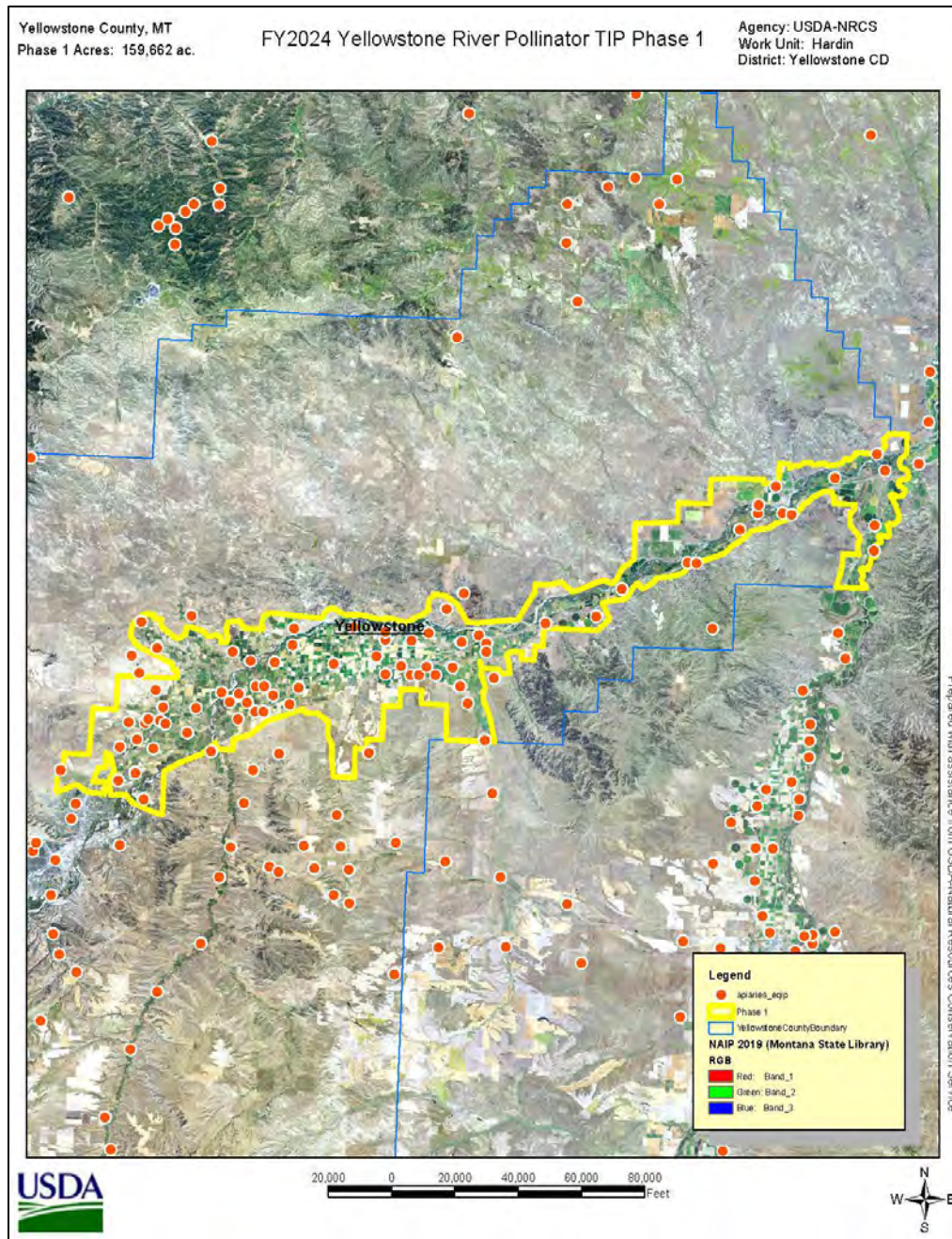


Figure 2.3 – Irrigation TIP Phase 1 boundary map with listed apiaries. Note the higher number of apiaries located along the river valley corridor. Larger versions of this map including Phase 2 are located in the appendix.

Table 2.4 Land Use Cover from the MT Natural Heritage Map

<b>30%</b>	<b>Agriculture</b>
	<ul style="list-style-type: none"> <li>• 29% (110,244 Acres)</li> </ul>
	<b>Cultivated Crops</b>
	<ul style="list-style-type: none"> <li>• 1% (4,284 Acres)</li> </ul>
	<b>Pasture/Hay</b>
<b>17%</b>	<b>Sagebrush Steppe</b>
<b>16%</b>	<b>Lowland/Prairie Grassland</b>
<b>16%</b>	<b>Developed</b>
<b>9%</b>	<b>Floodplain and Riparian</b>
<b>3%</b>	<b>Conifer-dominated forest and woodland (xeric-mesic)</b>
<b>3%</b>	<b>Open Water</b>
<b>2%</b>	<b>Bluff, Badland and Dune</b>
<b>2%</b>	<b>Introduced Vegetation</b>
<b>2%</b>	<b>Recently burned</b>
<b>&lt;1%</b>	<b>Mining and Resource Extraction</b>
<b>&lt;1%</b>	<b>Deciduous dominated forest and woodland</b>
<b>&lt;1%</b>	<b>Depressional Wetland</b>
<b>&lt;1%</b>	<b>Deciduous Shrubland</b>
<b>&lt;1%</b>	<b>Cliff, Canyon and Talus</b>
<b>&lt;1%</b>	<b>Herbaceous Marsh</b>
<b>&lt;1%</b>	<b>Scrub and Dwarf Shrubland</b>

The area usually experiences 11-14 inches of precipitation and experiences an average of 135 frost-free days, additionally there’s an average of 155 days that are freeze free. Much of the Yellowstone River valley is land that has been converted to agricultural and housing developments. Snowfall averages around 28 inches total and cover is typically around 1-3 inches. The historical climax community consisted of blue bunch wheatgrass, green needlegrass, western wheatgrass, thickspike wheatgrass, Sandberg’s bluegrass, purple prairie clover, dotted gayfeather, and winterfat.

Currently the primary crops that are grown in the county are sugar beets, wheat, malt barley, and hay crops in both dryland and irrigated fields. Common rotations on irrigated cropland include sugar beet, barley, wheat, and alfalfa.

Apiaries are placed throughout the entire Yellowstone River corridor in the county (fig 2.3). Studies have shown that native pollinator habitat provides consistent foraging for pollinator species throughout the growing season.

### Goals and Objectives:

What Phase 1 of this TIP will accomplish includes the following:

The primary goal of this TIP is to improve habitat for pollinators and honey bees. This will be completed by working with agricultural producers to plant diverse pollinator habitats that are undisturbed across bloom periods to provide food and cover for pollinators. This TIP aims to plant 1,000 acres (or approximately 758 football fields), of high-quality pollinator habitat throughout the area that will increase habitat connectivity, food availability, and undisturbed cover for pollinators and other wildlife species.

According to the NRCS West National Technology Support Center’s Plant Materials technology note 1 (March 2016), *“In 1948, center pivot irrigation was invented as a means to improve water distribution in crop fields. This was a great improvement in water distribution compared to flood irrigation, however, center pivots have created a new dilemma: the pivot corner. Pivot corners are troublesome. Square parcels with a circular system leave unused corners that can amount to 15 to 20% of the available area in a square parcel. The result is a large portion of unused ground that could be used to help bring in pollinators, insects, wind breaks or other beneficial practices...Unused pivot corners are an ideal location for pollinator plantings.”*

Working with irrigators we aim to successfully implement opportunities that provide necessary habitat for pollinators while simultaneously improving irrigation efficiency and profitability. Transition from flood to pivot style irrigation will improve habitat for native ground-nesting pollinators (which accounts for 70% of native bumble bees) Irrigators will be able to transition their systems to pivots, or other improved systems to facilitate improvements in irrigation efficiency. As improvements are made to irrigation systems acres will be set aside for undisturbed pollinator habitat. This includes pivot corners, less productive areas, odd areas, or ideal habitat locations. All irrigation projects will need to meet planning criteria for pollinator habitat as outlined on the NRCS Pollinator Habitat Evaluation Guide (PHEG).

Additionally, producers wanting to improve existing pollinator habitat with diverse plantings will also be targeted to meet the primary objective of improving pollinator habitat in the target area.

As people sign up for program funding, NRCS will collect baseline data for the following operations, including the following:

- Pollinator monitoring- Following the Xerces monitoring protocol, we expect to see a significant increase in pollinator use of plantings associated with this TIP. Monitoring will be completed twice during the year of signup and twice following establishment of the pollinator plantings.
  - Bee Monitoring Data for Large Habitat will be utilized, where field staff conduct a minimum of two 100 foot transects in open areas of plantings.
  - Pheasants forever staff will also perform pollinator monitoring every year following establishment of the pollinator planting.
- Irrigation Water Management- Existing methods of irrigation water management will be documented, and when conversion from floor to center pivot irrigation is planned, an updated irrigation water management plan will be created with the participant.
- Current and Planned Cropping Rotations.
- Current and Planned Residue Management.



## Alternatives:

- No Action Alternative – Irrigated cropland would continue to be managed at the existing level (no irrigation water management, no pest management with specific pollinator habitat considerations, no pollinator corners, or boarders, etc.) with existing on-farm irrigation infrastructure. If ag operators choose to install an irrigation pivot at their own cost, there is a significant potential for the pivot corners to remain idle, resulting in risks of soil erosion or decreasing soil organic matter.
- Pollinator Habitat Improvement – Management Only Alternative 1 (Not Chosen) – Eligible land uses would include: Irrigated Crop (main land use), but to also include AAL, Farmstead, Pasture, and Range.
  - Eligible Practices:
    - (512) Pasture & Hay Planting
    - (550) Range Planting
    - (386) Field Border
    - (327) Conservation Cover
    - (345) Residue and Tillage Management, Reduced Tillage
    - (329) Residue and Tillage Management, No-Till
    - (328) Conservation Crop Rotation
    - (449) Irrigation Water Management (this will be required to be planned)
    - (595) Pest Management Conservation System (this will be required to be planned but not necessarily contracted)
    - (645) Upland Wildlife Habitat Management (this will be required to be planned but not necessarily contracted)
- Pollinator Habitat Improvement – Management and Infrastructure Alternative (Chosen) – Work with irrigators to convert flood-irrigated fields to sprinkler irrigation and bring operations up to pollinator planning criteria minimums. Work with all interested producers to plant high quality pollinator habitat. Work with partners, landowners, and staff to manage and monitor pollinator usage on newly planted habitat stands. All irrigation projects will also plant pollinator habitat either in corners or borders of fields to promote habitat as well as will draw pollinators that can benefit crop production. Applicants who only wish to plant pollinator habitat are eligible to apply. To meet the intent of the TIP all applicants who want to install irrigation improvement projects will be required to plant pollinator habitat. Eligible land uses would include: Irrigated Crop (main land use), but to also include AAL, Farmstead, Pasture, and Range.
  - Eligible Practices (asterisked practices are listed on Montana’s Climate-Smart Activities FY2023 list):
    - (587) Structure for Water Control
    - (533) Pumping Plant
    - (430) Irrigation Pipeline
    - (442) Sprinkler System

- \*Due to the intent of this TIP to establish pollinator habitat in the corners of the field, only center pivot practices components will be allowed, and swing arms would **not** be allowed in this alternative. \*
- Primary CSAF Practices to establish pollinator habit – Each of these practices will require at least one blooming species per bloom period – early, mid and late. Seedings may contain a maximum 50% grasses and maximum 5% non-native legumes. To meet the intent of this TIP, at least one of four planting practices below will need to be contracted and will be listed as the primary practice for the application. See below for additional scenario information on specific practices.
  - \*(512) Pasture & Hay Planting
    - Scenario #2: Establishment of a mixture of adapted perennial species on a cropland, pasture or rangeland unit to improve wildlife habitat, benefit pollinators & beneficial insects, improve forage condition, and/or reduce erosion. This mix should contain at a minimum two or more species of native perennial species. This scenario has forgone income.
    - Scenario #3: Establishment of a mixture of adapted perennial species on cropland, pasture, or rangeland unit to improve wildlife habitat, benefit pollinators & beneficial insects, improve forage condition, and/or reduce erosion. This mix should contain at a minimum two or more species of native perennial species. No forgone income.
  - \*(550) Range Planting
    - Scenario #3: Establishment of a mixture of NATIVE perennial species on a cropland, pasture, hay land or rangeland unit to improve wildlife habitat, benefit pollinators & beneficial insects, improve forage condition, and/or reduce erosion. Seed mix must include 3 native forbs and 3 species of cool season native perennial grasses.
  - \*(327) Conservation Cover
    - Scenario #30: Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on land needing permanent vegetative cover that provides habitat for pollinators. The native grass and forb/legume mix include specialized species. In addition to providing pollinator habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems. This scenario includes forgone income.
    - Scenario #93: Permanent vegetation, including a mix of grasses, legumes, and forbs established on any land needing permanent vegetative cover that provides habitat, cover, and food for pollinators.
  - \*386 Field Border

- Scenario #7: A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly species.
- Scenario #44: A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production and includes foregone income.
- Scenario #46: A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production and does not include foregone income.
- Either of the following residue and tillage management practices will at a minimum be planned:
  - \*(345) Residue and Tillage Management, Reduced Tillage
  - \*(329) Residue and Tillage Management, No-Till
- \*(328) Conservation Crop Rotation
- (449) Irrigation Water Management (this will be required to be planned)
- (595) Pest Management Conservation System (this will be required to be planned but not necessarily contracted)
- \*(645) Upland Wildlife Habitat Management (this will be required to be contracted on all acres in the contract)
- Alternative 2 is believed to be the most effective alternative that will accomplish the project goal of additional pollinator habitat; both by creating flowering habitat, and by converting flood-irrigation to sprinkler irrigation, which will conserve habitat for ground-dwelling pollinators. Converting from flood-irrigation to sprinkler-irrigation will also enable producers to implement a greater suite of soil health practices on their fields, due to the ease of irrigating with a center pivot. This alternative is mutually beneficial to the agency and its customers by establishing pollinator habitat, providing best management practices for pollinators, and improving irrigation water application methods. Any projects funded through this TIP alternative will be implemented within the five-year contracting timeframe.

Alternative 3 (Not Chosen) –Work with all interested producers to plant high quality pollinator habitat. Work with partners, landowners, and staff to manage and monitor pollinator usage on newly planted habitat stands. While this alternative would create some new pollinator habitat, it wouldn't create and preserve habitat in as holistic of a manner as alternative 2. Eligible land uses would include: Crop, and Pasture.

- Eligible Practices:
  - (512) Pasture & Hay Planting

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- (550) Range Planting
- (420) Wildlife Habitat Planting

Implementation:

Our goal for this project is to create 1,000 acres of pollinator habitat, as well as converting approximately 3,000 acres of flood to sprinkler irrigation. Although it is a small percent of the total geographic area, 1,000 acres of highly diverse pollinating species can support upwards of 80 million or more pollinators. All irrigation projects will be required to plant highly diverse pollinator habitat either in corners and or borders of their fields. Higher ranking points will be given to irrigators who are willing to plant all of their pivot corners to pollinator habitat versus those who only plant a portion.

Table 3.1- Proposed TIP EQIP Budget and Timeline

Year	Acres	Project Cost	Estimated Number of EQIP Contracts
1	1000	\$ 800,000.00	4
2	2000	\$ 1,400,000.00	7
3	500	\$ 600,000.00	3
4	500	\$ 600,000.00	3
5	0	\$ -	0
<b>Total</b>	<b>4000</b>	<b>\$ 3,400,000.00</b>	<b>17</b>

Table 3.2 – (Using FY2023 EQIP Payment Schedule) Typical project estimate for a contract with one field.

Practice Code	Practice Name	Component	Unit Cost	Unit	Extent	Total Cost
587	Structure for Water Control	Misc. Structure, Medium	\$12,659.22	ea	1	\$12,659
587	Structure for Water Control	Flow Meter with Electronic Index	\$261.31	in	8	\$2,090
533	Pumping Plant	Electric-Powered Pump, 5 to 30 Horsepower	\$417.82	hp	30	\$12,535
430	Irrigation Pipeline	Polyvinyl Chloride (PVC) Pipe, less than or equal to 8 inch	\$2.85	lb	8000	\$22,800
442	Sprinkler System	Center Pivot, >= 1200 feet	\$655.76	ac	120	\$78,691
449	Irrigation Water Management	Intermediate IWM, Year 1	\$1,597.93	fld	1	\$1,598
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	1	\$871
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	1	\$871
595	Pest Management Conservation System	Plant Health PAMS (acs) Low Labor Only	\$11.24	ac	160	\$1,798
512	Pasture and Hay Planting	Pollinator Friendly, with Foregone Income	\$317.08	40	40	\$12,683
645	Upland Wildlife Habitat Management	Honeybee Monitoring	\$21.16	ac	40	\$846
Total Payment Rate						\$147,442.99

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*Table 3.3 – Typical project estimate for a contract with two fields.*

Practice Code	Practice Name	Component	Unit Cost	Unit	Extent	Total Cost
587	Structure for Water Control	Misc. Structure, Medium	\$12,659.22	ea	1	\$12,659
587	Structure for Water Control	Flow Meter with Electronic Index	\$261.31	in	8	\$2,090
587	Structure for Water Control	Flow Meter with Electronic Index	\$261.31	in	8	\$2,090
533	Pumping Plant	Electric-Powered Pump, 30 to 74 HP	\$319.56	hp	50	\$15,978
533	Pumping Plant	Soft Start, 30-75 HP	\$63.54	hp	50	\$3,177
430	Irrigation Pipeline	Polyvinyl Chloride (PVC) Pipe, less than or equal to 8 inch	\$2.85	lb	8000	\$22,800
430	Irrigation Pipeline	Polyvinyl Chloride (PVC) Pipe, greater than or equal to 10 inch	\$2.37	lb	6000	\$14,220
442	Sprinkler System	Center Pivot, >= 1200 feet	\$546.46	ac	120	\$65,575
442	Sprinkler System	Center Pivot, >= 1200 feet	\$546.46	ac	80	\$43,717
449	Irrigation Water Management	Intermediate IWM, Year 1	\$1,597.93	fld	2	\$3,196
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	2	\$1,472
449	Irrigation Water Management	Intermediate, Years 2 and 3	\$870.78	fld	2	\$1,472
595	Pest Management Conservation System	Plant Health PAMS (acs) Low Labor Only	\$11.24	ac	200	\$2,248
550	Range Planting	Native, Wildlife or Pollinator		40	40	\$12,683
645	Upland Wildlife Habitat Management	Honeybee Monitoring	\$21.16	ac	40	\$846
Total Payment Rate						\$210,479.26

*Table 3.4 – Typical project estimate for a pollinator planting without any irrigation improvement projects.*

Practice Code	Practice Name	Component	Unit Cost	Unit	Extent	Total Cost
386	Field Border	Field Border, Pollinator	\$378.45	ac	8	\$3,028
512	Pasture and Hay Planting	Pollinator Friendly, No Foregone Income	\$136.63	40	15	\$2,049
645	Upland Wildlife Habitat Management	Honeybee Monitoring	\$21.16	ac	23	\$478
Total Payment Rate						\$5,563.73

### Workload:

The Hardin Work Unit staff and PF Partner Biologists are expected to be able to handle the inventory and planning work of initial program applications for non-engineering practices, the Work Unit staff should also have adequate Job Approval Authority for at least 80% of the engineering planning.

Eventually, we hope this TIP will result in a “phase three” TIP for this project area that would expand up and down the Yellowstone River corridor beyond Yellowstone County if adopted by associated field offices in those counties.

## Partners:

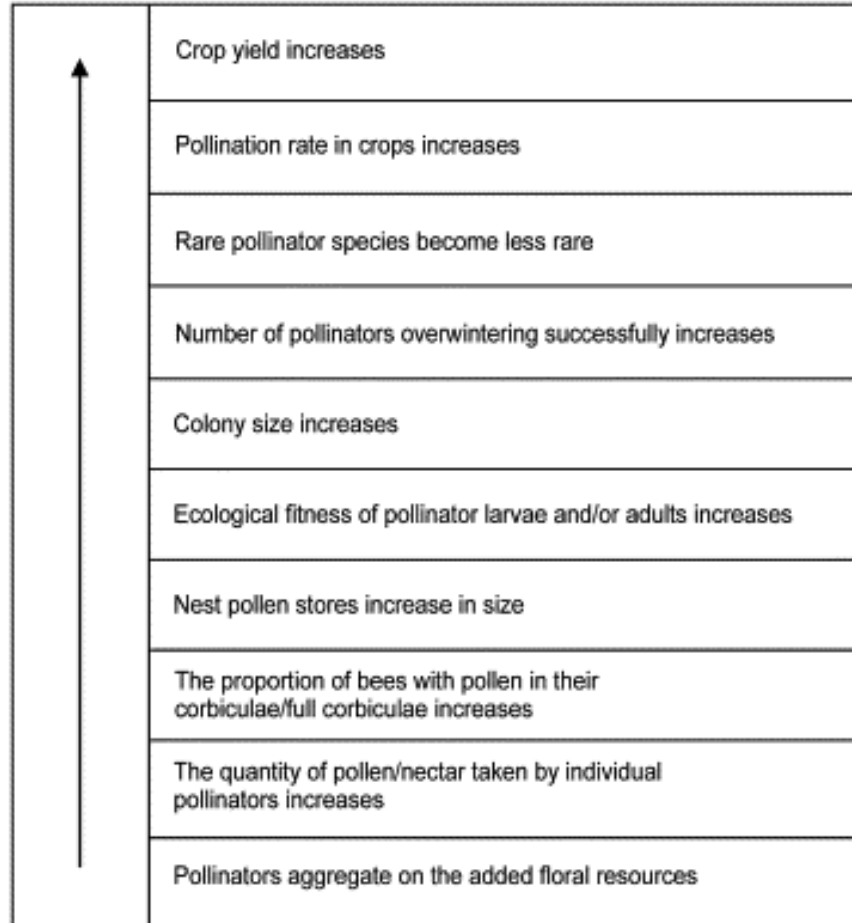
- Pheasants Forever – Pheasants Forever can provide outreach, conservation planning, and technical assistance to the public through the Billings and Hysham Partner Biologists, and through social media. Additionally, the PF pollinator working group has developed education and outreach material that can be used to show the benefits of planting pollinator habitat. The partner Biologists will likely spend 2-3 days or more per application for contracting and an additional 3 days for monitoring annually.
  - NRCS currently has PF-partner employees stationed at the Billings and Hysham NRCS Field Offices. These partner employees can assist the BHCD in their operator agreement by performing annual site visits to ensure the pollinator habitat is being maintained.
    - PF partner employee contributions to this TIP are estimated at about 80 hours annually, totaling 400 hours throughout the life of the Phase 1 TIP (80 hrs x 5 yrs), and approximately \$8000.00 in partner-contributed wages(400 x \$20/hr).
- Xerces – Xerces is the national leader for invertebrate conservation and consistently partners with the NRCS to conserve invertebrates across the states. They have written a letter supporting this proposal and are a source for significant information. All monitoring protocol is based on the Xerces/NRCS pollinator monitoring protocol. There could be opportunity for public information and expertise throughout the TIP. While working with Xerces Society on this TIP proposal, they had also requested to share this proposal with the Wyoming NRCS, as they have done work with them on pollinator habitat previously.
- MSU Extension – Agriculture Agent – MSU extension has expressed support for this project and how completing this TIP would be very beneficial. They are happy to provide technical assistance expertise and will be a valuable education partner in the agricultural industry.
  - MSU Extension will provide subject matter experts when outreach meetings are conducted. Each workshop would constitute at least 16 hours per subject matter expert (SME), which includes topic presentation preparation, travel, and actual presentation of the topic. With at least one outreach workshop planned for this TIP, MSU Extension’s approximate contribution to this TIP would be 16 hours, totaling \$640.00 (16 hrs x \$40/hr).

- Yellowstone Conservation District (YCD) –This CD has been regularly apprised of this TIP as we have planned it. The cooperator agreement (located at the end of this proposal), will be signed by the participant, where they will agree to maintain the pollinator plantings for a minimum of 15 years, and will grant the Pheasants Forever partner employees access to the sites for conducting annual pollinator species monitoring and pollinator stand status reviews.
  - YCD contributions to this TIP are estimated at about 40 hours for the life of this TIP, totaling approximately \$800.00 in partner-contributed wages (40 hrs x \$20/hr).

### Outcomes:

Studies have shown that enhancing floral resources benefits pollinators <sup>(8)</sup>. Benefits can be expected as in figure 4.1 below. Although it will be hard to quantify exactly how many more pollinators can be expected on the landscape, it is expected to cause a significant increase in pollinator carrying capacity as the area’s projects are implemented. The Pollinator Habitat Evaluation Guide (MT NRCS Biology Technical Note #19, Sept. 2021), or PHEG, is a tool that provides the NRCS planner with a relatively simple and objective procedure for determining the value of pollinator habitat for an area where a landowner is interested in the creation or enhancement of habitat. The guide can be used on land where pollinators are a primary or secondary resource concern. The PHEG tool shows the no action alternative having a nearly zero score for pollinator habitat value (PHEG score between 0 – 1.0). Both of the action alternatives show an average 0.58 habitat value score, which is a significant improvement to pollinator habitat within the TIP project area. To put this score into perspective, going from a nearly zero to a 0.58 score means the cropland landuse that had almost no valuable pollinator habitat now has viable pollinator habitat through an increase in pollinator plant canopy, and increased plant species diversity. Creating additional pollinator habitat will have positive effect on pollinator-reliant plants and will result in increased yields to these crops with zero increase to the carbon footprint.

- According to a 2014 study that compared the contribution of pollinators to crop yield and quality (Bartomeus, 2014), insect pollination enhanced average crop yields between 18 and 71%, depending on the crop. If crop fields adjacent to pollinator habitat saw a minimum 18% increase in yield to a field pea crop, this could result in significant income increases per field. For example:
  - Average yield per acre of Austrian Winter Pea could be 1000 lb/ac. If there was an 18% yield increase, you would see an additional 180 lb/ac. NASS data from 2021 shows roughly a \$10/CWT price, so there could potentially be a \$18/ac increase.



*Fig. 3.1 “A proposed hierarchy of the effects of deploying flowers in farmland to enhance pollinator fitness and effectiveness. Benefits to other farmland ecosystem services can accrue at any point on this hierarchy.” - <https://www.sciencedirect.com/science/article/pii/S0167880912002460>*



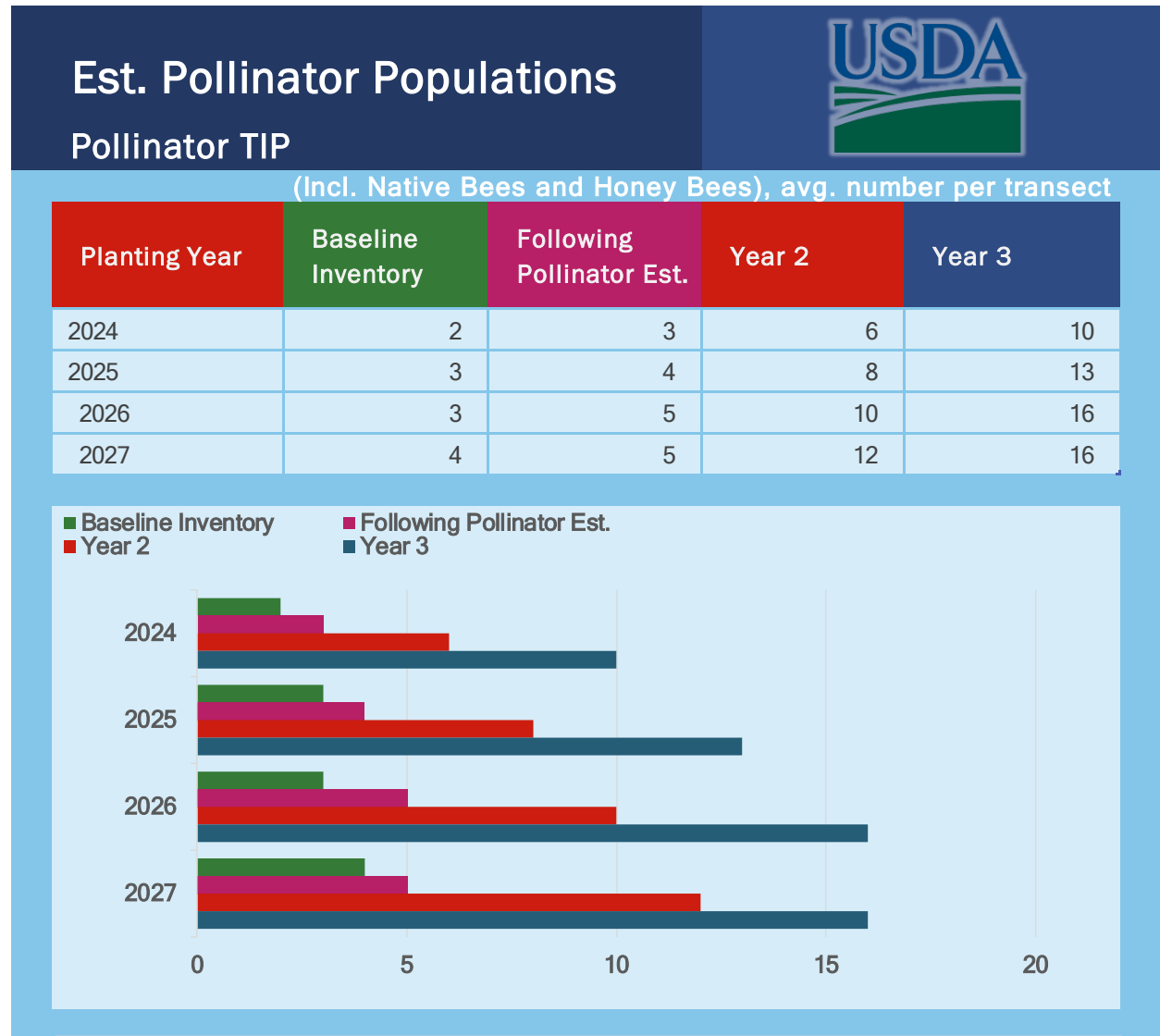
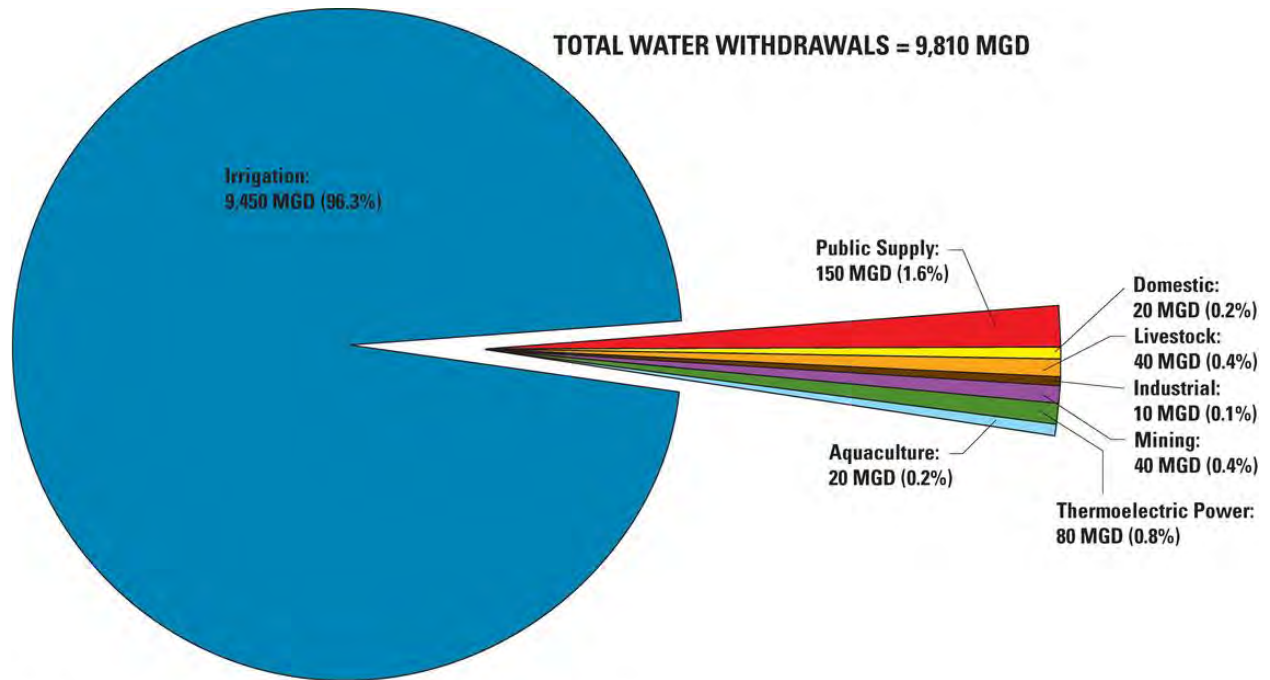


Figure 3.2 – Table showing the estimated increases in pollinator populations (averaged per site).

In addition to the great benefits it can have for pollinators, converting from flood irrigation to pivot irrigation will reduce mortality of ground nesting pollinators. Conversions to center pivot irrigation result in a significant labor savings and allow farmers to practice reduced tillage as well as diversifying their cropping rotations. Irrigation takes up most of the water use in the state of Montana and as the saying goes “Montana is always one week away from drought” stands true here. As drought have caused issues in the state for several years now, improving our highest water use category and making it more efficient, can lead to creating a climate change resilient Montana. Especially when Yellowstone County is one of the highest water use counties in the state (Fig 4.3) <sup>(14)</sup>. While these practices wont “save water” it would allow that water to be used for other uses.

FY2024 Yellowstone River “Corners and Borders for Pollinators” TIP Proposal



Total water withdrawals in Montana by category in 2015

Fig 4.2 – Water withdrawals in Montana by category in 2015 (source USGS (14))

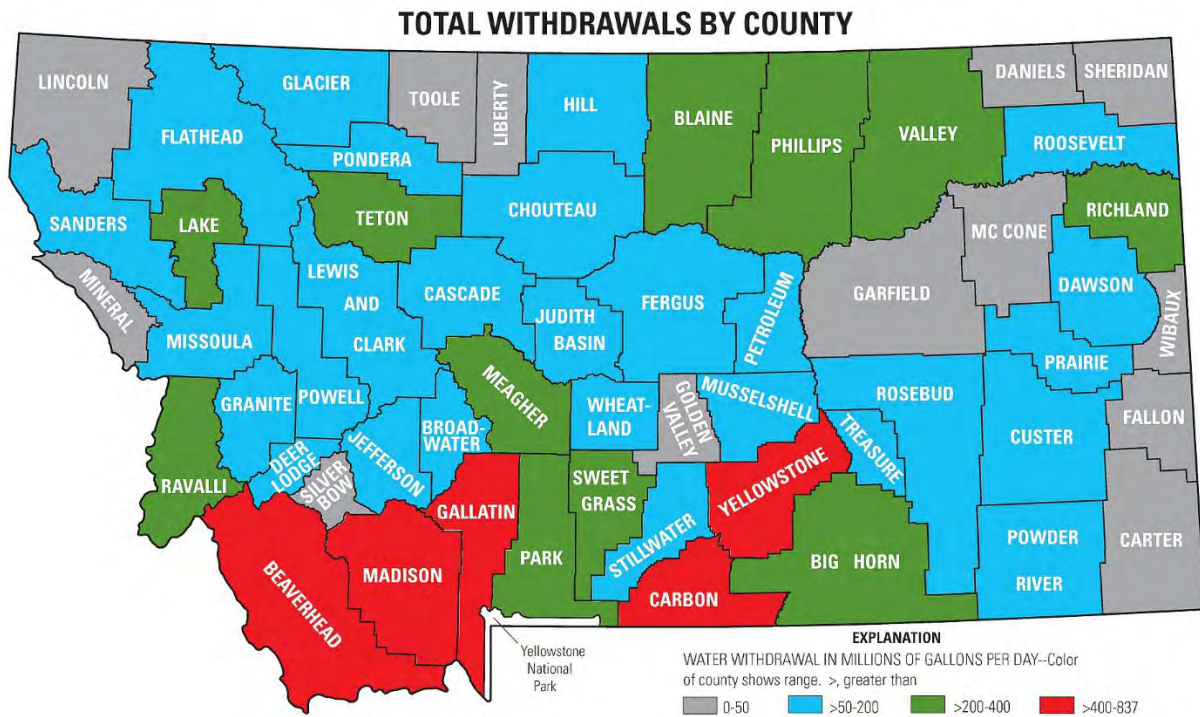


Fig 4.3 – Map of the 2015 Water Use withdrawal totals for Montana counties. (source USGS (14))

A common barrier to adopting soil health and climate practices such as Conservation Crop Rotation and Residue & Tillage Management on flood-irrigated crop fields is ensuring uniform application of irrigation water. By converting irrigated crop from flood to center-pivot irrigation, operators will be able to apply their irrigation water uniformly while adopting these practices, which also benefit pollinators and their habitat requirements.

### Ranking Questions:

1. If flood to center-pivot irrigation is planned, how much of the pivot centers will be planted to pollinator habitat?
  - a. 100% (If irrigation practices are not planned, select this answer.)
  - b. 75% to 99%
  - c. 50% to 74%
  - d. 49% to 30% (Any less than 30% will result in the project not meeting the intent of the TIP and will not be considered for funding in this TIP fund pool.)
2. Does the seed mix have at least four forb species from the MT-20 Biology Tech Note “Creating and Enhancing Habitat for Pollinator Insects”?
  - a. Yes
  - b. No
3. Does the seed mix have at least four forb species that bloom in the early, mid, and late seasons?
  - a. Yes
  - b. No
4. Is the project within a mile of an apiary?
  - a. Yes
  - b. No
5. Will any of the following practices be contracted: (595) Pest Management System; (345) Residue and Tillage Management, Reduced Till; (329) Residue & Tillage Management, No-Till; ?
  - a. Yes
  - b. No
6. Are there no irrigation practices in this application (application only seeks to create pollinator habitat)?
  - a. Yes
  - b. No
7. How far is this project located from riparian habitat?
  - a. Directly adjacent
  - b. Less than ¼ mile
  - c. ¼ mile or greater

Appendix and Additional Supporting Documents:

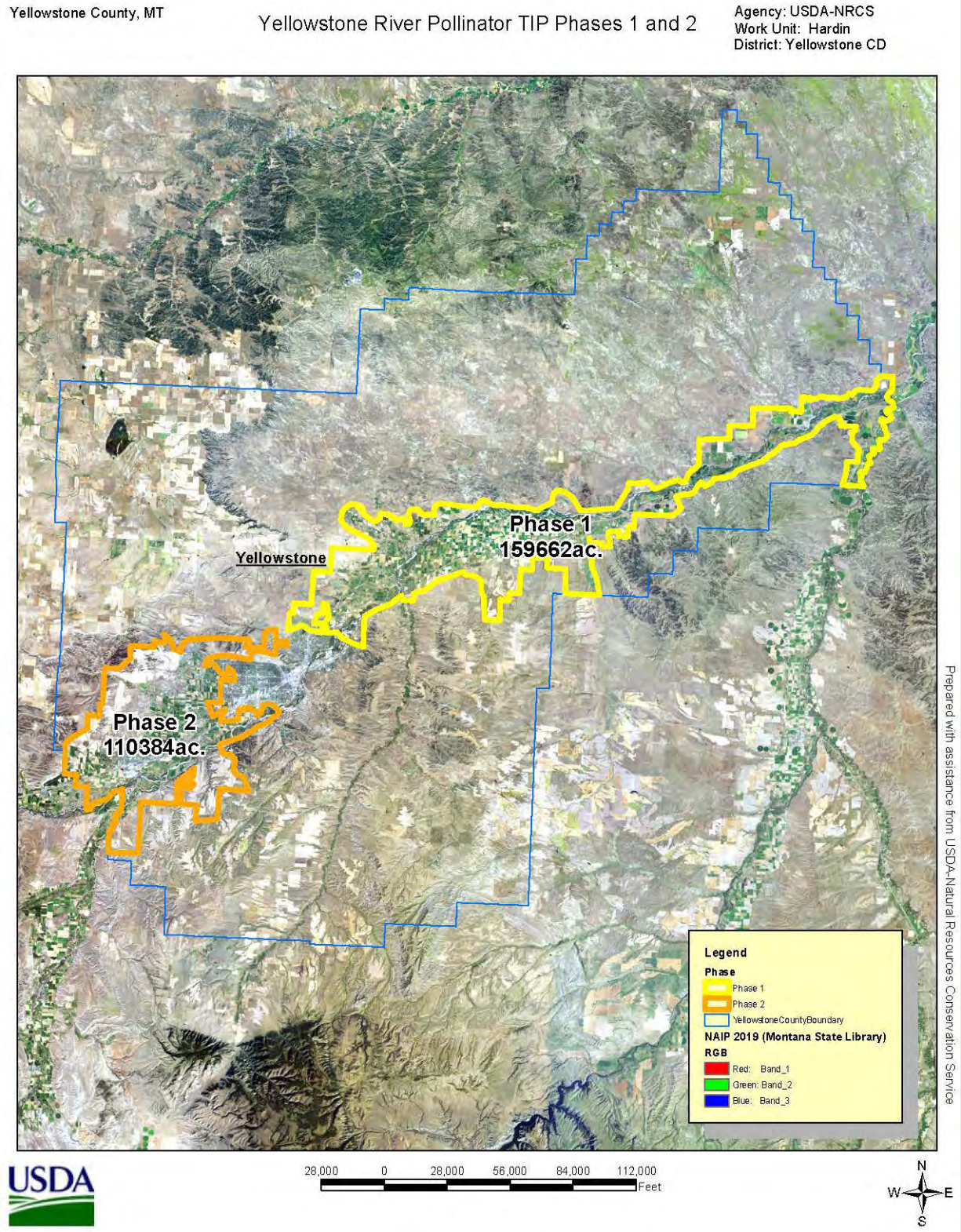


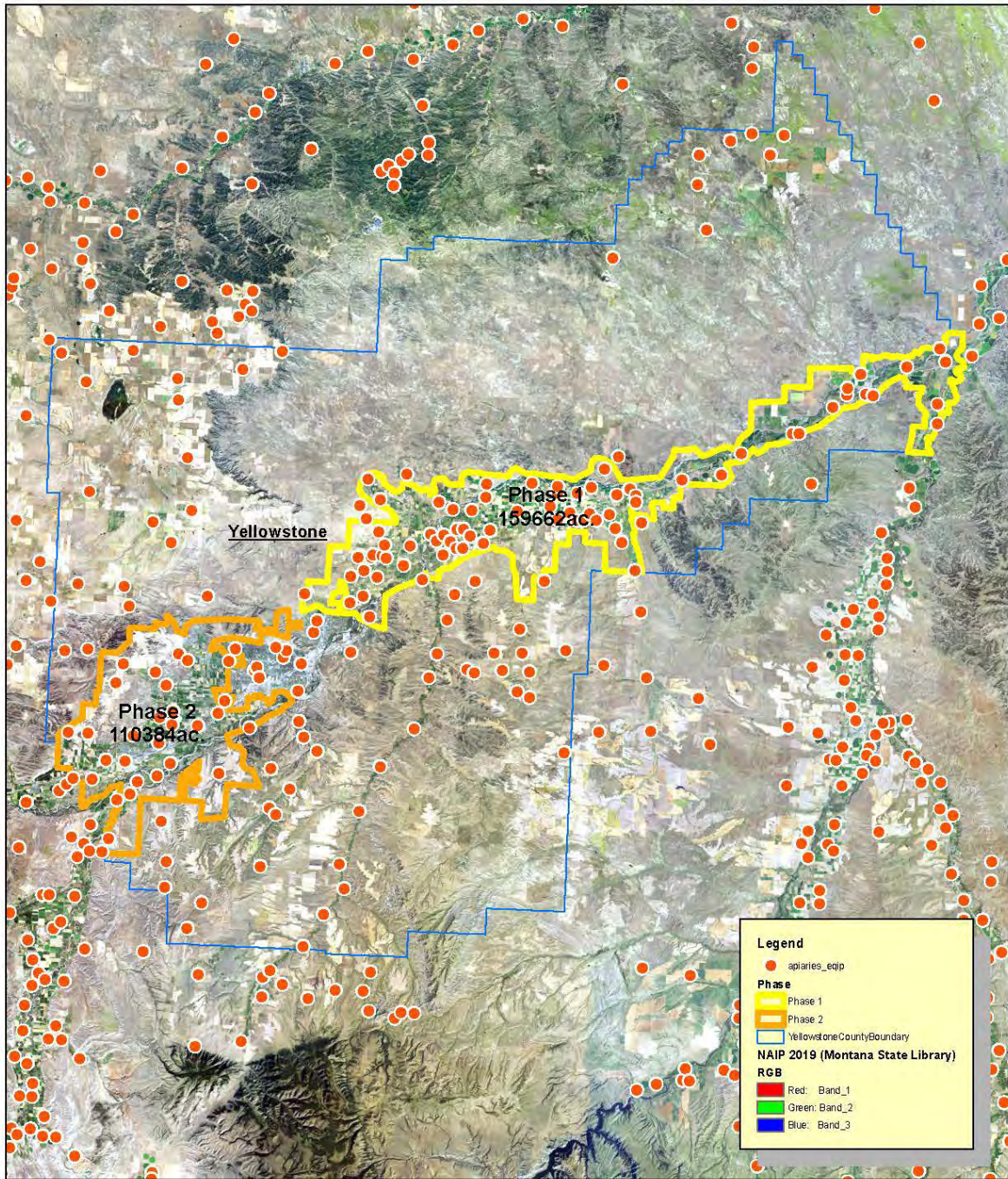
Figure 5.0 – TIP Phase Areas.

# FY2024 Yellowstone River "Corners and Borders for Pollinators" TIP Proposal

Yellowstone County, MT

Yellowstone River Pollinator TIP Phases 1 and 2

Agency: USDA-NRCS  
Work Unit: Hardin  
District: Yellowstone CD



Prepared with assistance from USDA-Natural Resources Conservation Service



Figure 5.1-Pollinator TIP Boundaries for Phases 1 and 2 with mapped apiaries.

# FY2024 Yellowstone River "Corners and Borders for Pollinators" TIP Proposal

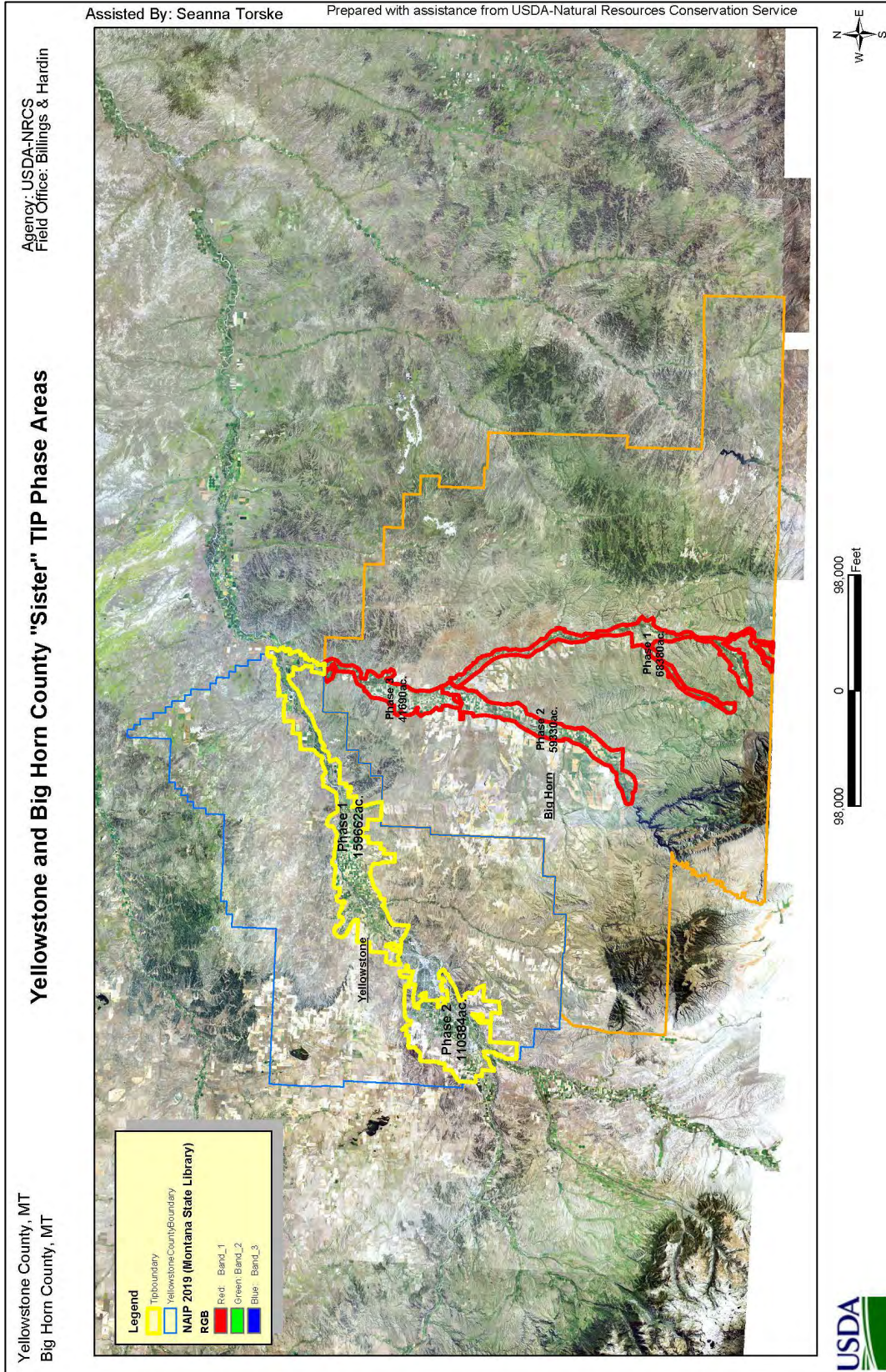


Figure 5.3 – Proposed “Sister” TIPs in Big Horn (in red) and Yellowstone Counties (in yellow).

# FY2024 Yellowstone River "Corners and Borders for Pollinators" TIP Proposal

Assisted By: Seanna Torske Prepared with assistance from USDA-Natural Resources Conservation Service

Agency: USDA-NRCS  
Field Office: Billings

## Yellowstone Pollinator TIP

Yellowstone County, MT

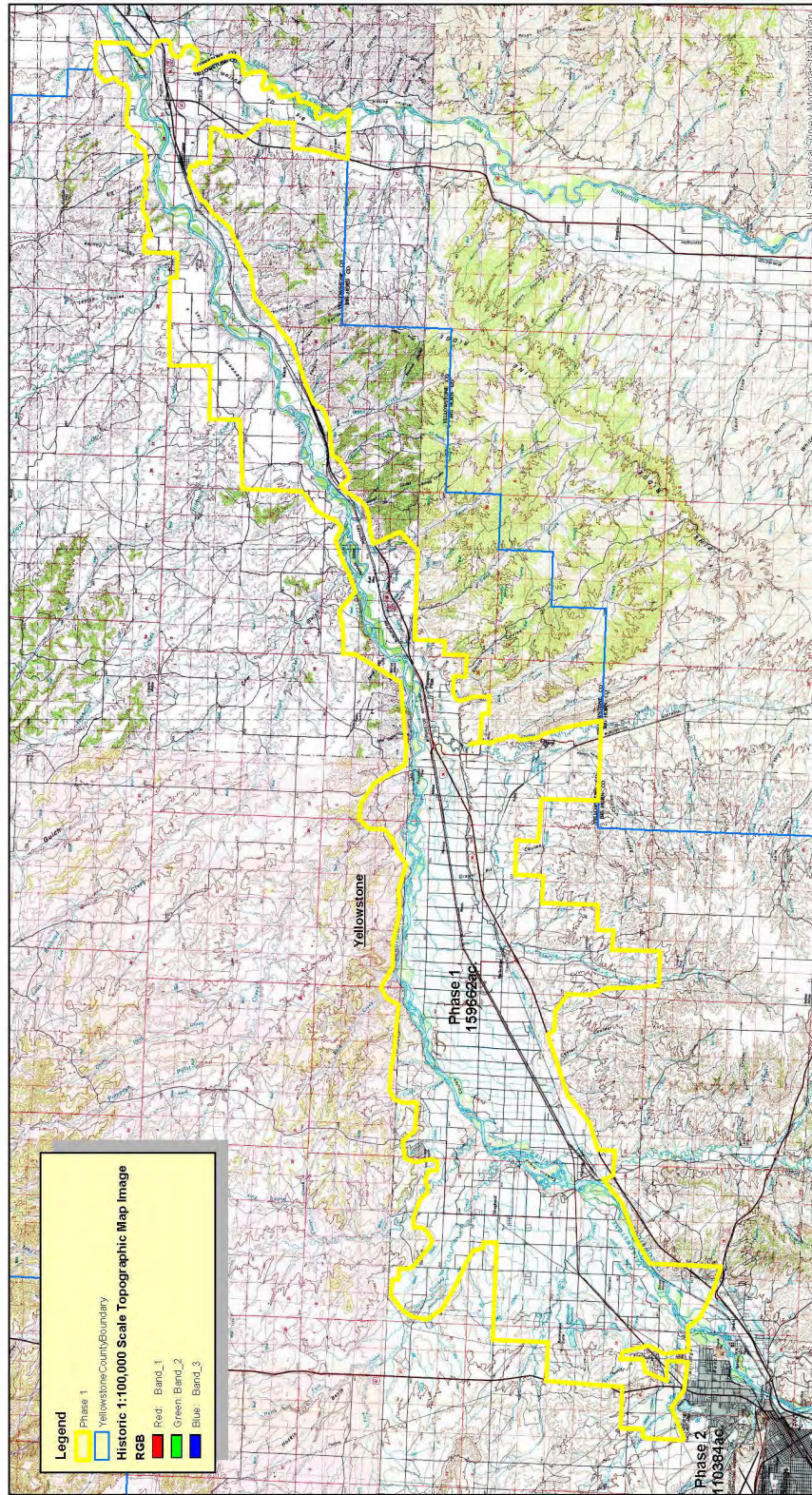
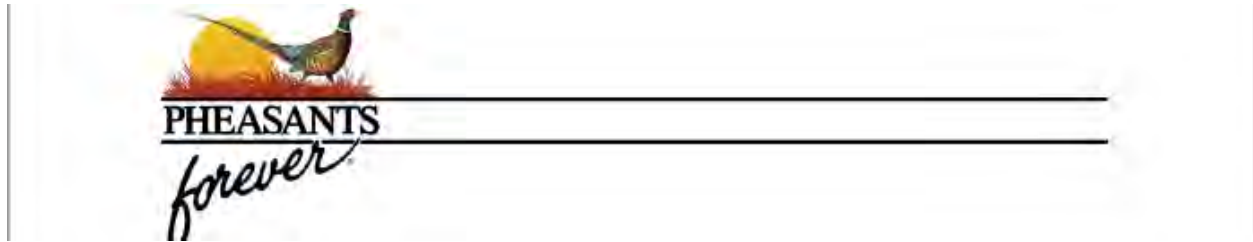


Figure 5.4 – TIP Project Area Topo Map



## Pheasants Forever – Montana Letter of Support



TO: Natural Resources Conservation Service

RE: Support for the Yellowstone County Targeted Implementation Plan (TIP) FY 24 Proposal  
“Corners and Borders for Pollinators”

Dear NRCS:

On behalf of Pheasants Forever, I am writing in full support of the Yellowstone County Targeted Implementation Plan (TIP) FY 24 Proposal “Corners and Borders for Pollinators.” Pheasants Forever and the NRCS have a strong partnership and have successfully completed multiple partnership projects. This TIP is a continuation of this strong partnership and helps move the needle for conservation of imperiled pollinator populations. Additionally, this TIP provides win-win opportunities for agricultural operations which is the foundation of successful private land conservation activities.

The conservation activities supported by this TIP will complement a variety of ongoing conservation initiatives that PF and other partners are currently implementing in the state of Montana. Our local partner biologist staff hosted by Pheasants Forever in partnership with NRCS in Billings and Hysham will be a critical component of the successful implementation of this TIP and can effectively leverage other partnerships to ensure this TIP’s success. Additionally, Pheasants Forever is committed to assisting with the producer outreach, cost-sharing quality pollinator seed, and monitoring of pollinator plots.

Pheasants Forever is dedicated to the conservation of pheasants, quail, and other wildlife through habitat improvements, public access, education, and conservation advocacy. Pheasants Forever strongly supports the efforts of the Yellowstone County NRCS and their vision of this Targeted Implementation Plan. We look forward to this continued partnership successful execution of this proposed project.

Sincerely,

A handwritten signature in black ink, appearing to read "Hunter VanDonsel".

Hunter VanDonsel  
Montana/Wyoming State Coordinator  
Pheasants Forever inc.

## Xerces Letter of Support



Protecting the Life that Sustains Life

October 10<sup>th</sup>, 2022

Dear NRCS:

I write on behalf of the Xerces Society for Invertebrate Conservation in support of the Yellowstone County Targeted Implementation Plan (TIP) FY 24 Proposal “Corners and Borders for Pollinators.” Pollinators and the pollination services they provide are essential to agricultural systems and human health and diet. Additionally, pollinators are key to the health of flowering plants and the wildlife that depends upon those plants. This TIP will advance the conservation of pollinator populations in Montana while simultaneously giving agricultural producers the opportunity to improve their operations and irrigation methods.

The Xerces Society for Invertebrate Conservation is an international nonprofit organization that protects the natural world through the conservation of invertebrates and their habitats. Thus, creating, enhancing, and protecting pollinator habitat is one of Xerces’ primary goals. The Xerces Society therefore fully supports the goals and commitments presented within Pheasants Forever’s Yellowstone County Targeted Implementation Plan (TIP) FY 24 Proposal “Corners and Borders for Pollinators.” Please consider this valuable project.

Thank you for your time.

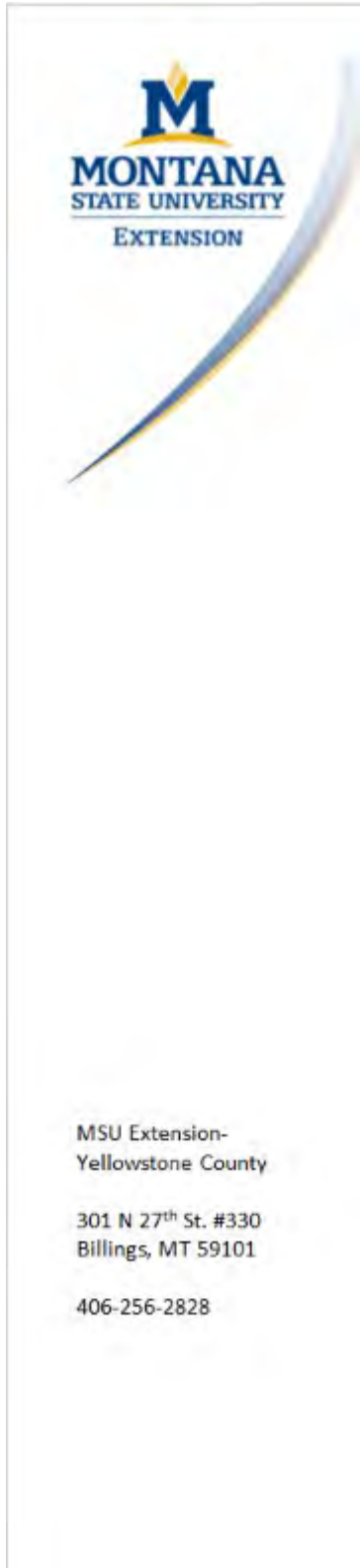
Sincerely,

Sarah Hamilton Buxton  
Farm Bill Pollinator Conservation Partner  
Xerces Society for Invertebrate Conservation

[Sarah.hamilton-buxton@xerces.org](mailto:Sarah.hamilton-buxton@xerces.org)

(701) 530-2014

## MSU Extension Letter of Support



October 24th, 2022

To whom it may concern,

I, Trestin Feagler of the MSU Yellowstone County Extension Office, am writing on behalf of NRCS and Pheasants Forever regarding a TIP proposal to secure funding for landowners to convert flood irrigation systems to pivot irrigation systems with a focus on pollinator habitat conservation in Yellowstone County. I would like to express my support for this project with the goal of providing financial assistance to landowners wishing to convert their flood irrigation to a pivot system and to conserve pollinator habitat.

As the Yellowstone County Extension Agricultural Agent, I am more than happy to partner with this project by providing education to the public on the importance of pollinator habitat and the benefits of switching to a pivot irrigation system. This funding is valuable to Yellowstone County, as agriculture is the most important industry, our community members rely on the efforts of pollinators to ensure that we have crops and forage return year after year. Additionally, with water accessibility becoming more difficult, systems such as pivots will become increasingly important for farmers in this region.

Please do not hesitate to reach out with additional questions.

With regards.

Trestin Feagler  
Yellowstone County Agriculture Extension Agent

MSU Extension-  
Yellowstone County

301 N 27<sup>th</sup> St. #330  
Billings, MT 59101

406-256-2828

## Yellowstone Conservation District Operator Agreement



### Yellowstone Conservation District Operator Agreement

I, \_\_\_\_\_ (Printed Name), will agree to maintain the perennial pollinator habitat for at least fifteen years (minimum estimated practice lifespan of the irrigation projects listed in the Pivot for Pollinators Targeted Implementation Plan proposal) according to the NRCS practice standards and specifications for the planned pollinator practice. By signing this agreement, I am also allowing any partner employees access to the pollinator habitat to perform annual status reviews to ensure establishment, and to make any recommendations to address stand issues that may be present.

Signed: \_\_\_\_\_  
OPERATOR SIGNATURE DATE

Acknowledged by:

\_\_\_\_\_  
YELLOWSTONE CONSERVATION DISTRICT REPRESENTATIVE DATE

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